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Title: RIMAS - Optical Design Development of the Imager/Spectrometer for the
Discovery Channel Telescope

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Abstract:

The Rapid IMager - Spectrometer (RIMAS) is a collaborative effort between the University of Maryland at College Park, NASA-GSFC and Lowell Observatory designed for use on the 4.3 meter Discovery Channel Telescope at Lowell. The primary science goal of the instrument is the study of gamma-ray burst (GRB) afterglow appearing in the near-infrared. Continuous operation will allow measurements beginning minutes after the prompt emission. We present the results of the RIMAS optical design development. The instrument consists of two arms separated by a dichroic: the first for the Y and J bands (0.9 - 1.35 microns) and the second for the H and K-bands (1.5 - 1.8 and 2.0 - 2.4 microns). Each arm will be equipped with two broad band filters for imaging, as well as low resolution and echelle grisms. The imaging modes are designed to be diffraction limited, with one pixel corresponding to ~ 0.35 arcseconds, while the diffractive modes have resolving powers of approximately 20 and 4,000. With photometric and spectroscopic capabilities, RIMAS will be well positioned to quickly determine redshifts, followed by high resolution spectroscopic studies of GRB afterglow.